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ABSTRACT

The purpose of this study was to reveal trends, indicate fields for further research and action, and expose problem areas for further study at the international level. The study objectives are to review: (1) the course patterns and degree structures developed at the Open University in the United Kingdom, (2) new degree courses in the United Kingdom, (3) curriculum reform in France, (4) Norwegian regional colleges and their new study courses, (5) development in Swedish higher education, (6) developments in university education in Germany and Denmark, (7) the problem of evaluating new curricula. Appendixes include the framework for the study of professional examinations, extracts from the British statement of objectives for engineering sciences, and a framework of analysis for innovations in international higher education. (Author/PG)

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COMMITTEE FOR HIGHER EDUCATION AND RESEARCH

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NEW PATTERNS OF COURSES AND NEW DEGREE STRUCTURES

by

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Meeting of experts on new patterns of courses and new degree structures, Strasbourg, 13 - 14 May 1974

NEW PATTERNS OF COURSES AND NEW DEGREE STRUCTURES

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Purposes of the study*

The requirement of this study was that it should be on the basis of existing OECD and Council of Europe material on curriculum reform. Its purpose is to reveal trends and indicate fields for further research, and action and problem areas for further study at national level. The study was required to take into account:

- The course patterns and degree structures developed at the Open University in the United Kingdom.
- New degree courses in the United Kingdom.
- Council of Europe documents on curriculum reform in France.
- Council of Europe documents on the Norwegian regional colleges and their new study courses.
- Developments in Swedish higher education.
- Developments in university education in Germany and Denmark.
- National studies at present under preparation.
- The problem of evaluating new curricula.

Introduction and summary

In addition to the required review of documents listed above, a number of other sources were consulted, including the documents of the 1973 OECD conference on "Future Structures in Higher Education". Visits were made to the OECD conference, the Open University and a number of experts. Reference was also made to the Registers of Research (1) and other sources of information on research (2). Note was taken of the Council's documents on curriculum reform (3) in post primary education. This report should be taken as extending the debate in these documents, with special reference to the evaluation of systems and curriculum. Discussion of specific curricula is avoided for the most part, since there is little data on which to make comparative assessments. Clear statements of behavioural objectives are required for such evaluation. Detailed suggestions about the type of data (and method of collection) are made in both the text and the appendices. The need for depth discussions by

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* This description is from Promotion of Research into Higher Education. CCC/ESR (72) Misc. 16. 1972.

working parties is emphasised and frames of reference for such debate are included in the appendices.

Inspection of the data reveals the need for a glossary of terms. For example, the term "assessment" has a number of meanings and is used in different ways within the same context. Other general needs which would aid the comparative evaluation of curriculum are listed. The problems of evaluation in higher education are considered.

Much of the legislation affecting changes in the structure of education is of recent origin. Little time has elapsed for it to be implemented (4). Legislation is also impending and the subject of public discussion (5). The extent to which these plans will be fulfilled remains to be seen. There is every indication from the economic state of Europe that higher education will grow (and, as a consequence, change) more slowly than previously anticipated. The Open University has stimulated much discussion and other countries are considering adopting systems (6) which owe a debt to this development. Innovation continues apace and seems to be on the increase (7), even in systems where courses are the subject of legislation (8). The American experience is similar (9). The systematic recording of innovation is recommended and a frame of reference for the study of innovation is included in Appendix C.

There is growth in the number and forms of interdisciplinary study (10). The range of goals which such courses expect to achieve is wide. There is need for research into student learning and the behavioural outcomes of such courses, as well as into the general problems of curriculum innovation in institutions of higher education (11).

The relations between education and work are discussed in many reports. Much emotion is generated on behalf of one view or another. The recent discussion on the Irish Report on Apprenticeship is a case in point (12). A greater understanding of the relationship between the 2 would arise if basic principles of learning were applied and used in the comparison of skills developed in education with those required for jobs. Interdisciplinary approaches to the solving of practical problems may confirm that the differences between the 2 sectors are minimal when seen in terms of problem-finding and problem-solving.

Beliefs about the economy and society have profoundly influenced national plans for the development of education. Different solutions are responses to different goals. Binary systems have been established in England (13), Ireland (14) and Norway (15). A fully comprehensive system of education is to be developed in Sweden (16). Germany proposes in the future

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to develop comprehensive universities (Gesamhochschulen) but these proposals are the subject of much debate (17). In France response to the practical needs of industry at the higher technical level has been met by the creation of university institutes of technology (18). In order to make the system more flexible, short cycle diplomas are being introduced in several countries. Substantial changes in the structure of tertiary education systems would profoundly influence the structure of education for the semi-professions. Changes in society and technology and increased expectations come together to create an increased interest in recurrent education. One country, France, has implemented legislation enabling workers to obtain release for study. Sweden intends that it will play a major role in her system.

Recurrent education is probably the area most in need of research and further study. It is important to investigate the role of second-level education as a preparation for recurrent education. It is also important to study the possible forms of recurrent education, the rate of course cycling for effective learning and the types of learning experience suited to adult learning. There is much to be learned from the experience of industrial training.

Trow's views, (i) that prescriptive and centralised planning leads to rigidity (19) and (ii) that institutions tend to converge toward the forms and practices of the most prestigious models of higher education, suggest that it will be difficult to develop diverse curricula. Systems studies of institutions are essential if the processes of change at work in higher education are to be understood. Governments should be persuaded to experiment with new forms of decentralised administration and certification in tertiary education.

I. Interdisciplinary study

The response to the rapidly changing frontiers of knowledge has been to develop new specialism (eg operational research) on the one hand, and expand the areas of knowledge contained in the traditional disciplines on the other. Cross-fertilisation between subjects has been reinforced by the fact that both scholarly and practical problems often require knowledge and skills from a range of disciplines. Courses which utilise a number of disciplines are called interdisciplinary. The term is also used for the separate study of diverse subjects (eg physics and economics). But such study is hardly interdisciplinary; bidisciplinary would be a more appropriate title. Inspection of the OECD report on interdisciplinary studies shows them to be varied in

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approach and content. There are radical differences in goals (20). At the University of Ruhr-Bochum, the Institute for the Sociology and Politics of Work has the aim "to establish a single theory for work, at the conceptual level, and to bring together as much sociological, economic and psychological information as possible at the data level". The OECD writers schematised this approach as follows:

- A single, complex, concrete problem.
- Disciplines noteworthy for their viewpoints -
  a. The variety of their viewpoints.
  b. The possibility that the fields involved overlap.
  c. The fact that no single discipline covers the entire problem.
- Different solutions, all of which are necessarily incomplete, depending on the viewpoint of each discipline.
- A synthesis.
- A single solution.

Heywood (21) has termed this type of approach transdisciplinary. He provided a similar course for undergraduate engineers aimed at linking the behavioural sciences and humanities in a common framework as an introduction for engineers to their role in industry and society. This course was broad and introductory, designed only to meet the first stage of Whitehead's cycle of learning (22). Students used to unitary discipline approaches have difficulty with this kind of study. There is also a danger that their grasp of the thought processes of the individual disciplines contributing to the solution of multidimensional problems. There is need for research into the methods of knowledge/skill map making, student learning and behavioural outcomes of interdisciplinary courses.

II. Education and work

The relations between education and work are discussed in many reports. There is, on the one hand, the belief that education should not concern itself with work and, on the other hand, that education is very much concerned with work. The latter view is the basis of the Swedish reforms.

"Since we have decided that, in principle, every branch of the upper secondary school or any corresponding experience shall qualify in a general sense for higher education, and since the majority of our youngsters go to upper secondary school, we

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claim that higher education should serve the needs of qualified training and education of any adult" (23), and, "The labour market is thus regarded as one of the important factors in the planning of post-secondary education. In order for higher education to be offered to as many as possible, the general conditions of admission will not, in the future, be tied to any specific branch of the upper secondary school and admission will be given to adults without formal qualifications, taking into account, in principle, only the specific knowledge needed to follow the intended course of study ..... Post-secondary education will, to an increasing extent, be offered to persons with work experience who are tied by their job or family to a specific place or neighbourhood. The future planning of post-secondary education has thus to be seen in the context of recurrent education, with implications in the long run for the content and structure of studies" (24).

Whereas in England the demand for qualified manpower was the major force in the expansion of the system, the subsequent satisfaction of this need has meant that there is more discussion about education per se and the best ways of meeting the demand for tertiary education. The Open University is the main facility aimed at adults who have no alternative means of securing higher education. Numerus clausus for this institution is operated on a first come first served basis.

In France it was decided to offer short study courses to meet the needs of higher technical education. These courses would be offered in university institutes of technology. This training implies:

- "A specialisation which is more narrow and more profound than that of engineers;
- a wider general education than that of technicians;
- the development of the personality and the individual's abilities of expression, communication and adaptation" (25).

In the Netherlands discussion of the future of tertiary education has culminated in a bill which will provide for the integration of university education and higher vocational training. An unusual aspect of the proposals is that "the purpose of the co-ordination of teaching is, in the first instance, to make it possible for university students to transfer to higher vocational training institutes during their courses and the other way around .... University students whose capacities prove in the prepaedeutic stage to

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be more suited to the curriculum of a higher vocational training course in their subject must be given the opportunity to switch over with as little time as possible" (26).

A basic question is whether curricula which have different purposes can be attuned to each other. It seems that the German view is that they can, for in the Gesamhochschule, "the basic idea is to have, for example, teachers of equal status and only one type of engineer with either more practical or more scientific interest" (27). At the University of Bath, where a range of practical and theoretical courses are provided by the Department of Engineering, participation in the more practical aspects of engineering while more suitable to some students will produce a lower degree class.

The evaluation of these beliefs can only be accomplished when clear statements of objectives (Appendix B) are established and simple theories of knowledge and learning assembled. The thinking required to achieve such aims has not been done in higher education. If studies of work are completed along the lines suggested in Section IX it may be found that the skills required for work are in any case those supposedly developed in education. Indeed, this seems obvious when terms such as problem-solving, problem-finding and transfer of learning are employed. The liberal aspect comes in the knowledge required for the development of personal value systems. Skills and values are inextricably interwoven between work, family life and leisure. There is no real conflict between the requirement of life and the requirement of society. The question is whether education and training aid the development of skills and the formation of attitudes and values. These are the matters for research.

III. Short cycle education

The combination of demand for full-time higher education and stringent economy led to the development of short cycle courses. In France a terminal diploma is awarded at the end of the course of study in an institute of technology (diplome des instituts universitaires de technologie). About 10% of the graduates from these courses are expected to continue in higher education. The Faculty course in France is now organised in 3 2-year cycles, each of 2 years' duration. This aim was achieved by the creation of 2 new diplomas and a licence and master's degree. The 2 diplomas have been replaced by a single diploma for the first 2-year cycle*. It leads to a job or 1 of several routes in the university. One of these

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*diplôme d'études universitaires générales (DEUG)

is the Licence taken at the end of the first year of the second two-year cycle. From the Maitrise the student enters the third two-year cycle for a Doctorat qualification. Between the Maitrise and the Doctorat, the important agregation remains unchanged (28).

Two-year short cycle courses in the social sciences and economic/administrative (management) sciences are among those developed by the new regional colleges in Norway. Among the purposes of these colleges is the requirement that they should provide for the specific needs of the region in which they are located (see also Section VI). The external examiner system has been adopted as a means of maintaining standards, but the colleges are being encouraged to experiment with new forms of assessment (29).

Whereas the French Diplomas are in series with university study, it seems as though universities may be discouraged from operating the newly proposed English 2-year Diploma of Higher Education. It is intended that the entry requirement should be the same as that for a university course. It "must be no less demanding intellectually than the first 2 years of a course at this level". The Diploma "must be made generally acceptable as a terminal qualification and, in particular, as a qualification needed for entry to appropriate forms of employment". Since the courses should be designed, where appropriate, to give credit toward other qualifications such as degrees, it may turn out to have some resemblance to the French national diplomas (30).

There is little need to underline the value of monitoring these developments. The chief difference between them and the Swedish short-cycle courses are that the Swedish courses are to be seen within the context of recurrent education.

The dilemma of systems which assume that education should take place in one block whether it be to 16 or 25 years of age is that apart from the fact that it is seen as a "preparation for life" rather than as an "aid in life", the greater its length the more individual competitiveness is transferred from the "economic to the educational world, from the office and workshop to the school and university" (31). The effect of this is that "the educational ladder leads into them (32) but there is no ladder leading out. The grade above is entered by a different road starting at a different level of the educational system. Social structure, in so far as it reflects occupational structure, is frozen as soon as it emerges from the fluid preparatory stage of schooling. Mobility between generations is increased, but mobility during the working life of one generation is diminished".

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Granted that the system of examination is likely "to be more favourable to mobility than one of arbitrary appointment or casual promotion" (33). The question remains, and should be a matter for continuing investigation, as to whether there is sufficient flexibility between courses in the new structures of higher education for the professions use educational qualifications as a means of entry and in their view status is clearly related to standards. In England the mobility between technician and technologist is likely to be reduced to a minimum by the restraints on transfer which have been introduced between the different routes. Monitoring of this effect needs to take into account the abilities of the participants and the skills required for the jobs to be done (see Section IX). It would seem that the West German Rector's Conference expects this problem to be overcome, as will be seen from their arguments for the Gesamhochschule listed below .... "one condition is the suppression of hierarchical graduation (evaluation) of existing professional patterns and career regulations". According to Trow, such changes are inevitably achieved in mass higher education*.

IV. New patterns of organisation

In England and Wales, Ireland and Norway, binary systems have been developed in which universities and polytechnics (regional colleges) exist side by side. Given Trow's view that "there is a tendency for institutions to converge toward the forms and practices of the most prestigious models of higher education, a tendency which operates independently of government control ..... we see that the forces working against diversity in higher education are very strong at a time when expansion increases the needs for diversification of forms and functions beyond what presently exists" (34), then a binary system is but a stage in the growth toward a fully comprehensive system.

The Swedish development obviously demands a new approach to the organisation of higher education. In Denmark the policy is to develop along comprehensive lines. The University at Roskilde will be comprehensive (see page 32). It is the intention in Germany to create a system of integrated** comprehensive

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* Trow (ibid Ref 19). He writes "what mass higher education does is to break the old rigid connection between education and the occupational structure under which a degree not only qualified men for a certain range of occupations and profession, but also disqualified them for all jobs which formerly did not employ graduates".

** ibid Ref (17).

Co-operation means: More or less close association of independent institutions, the minimum basis being mutual agreements and the maximum, the existence of some common curricula and joint bodies.

Integration means: Common curricula and joint governing bodies in which the original autonomy of the institutions is merged as fully as possible in a single unified organisation.

universities (eg Universities of Bremen, Bielefield, Konstanz). In their view, the university is comprehensive not by comprising within its organisation all study subjects and curricula, but by offering within the framework of one or more subjects an organic entity of diversified study courses.

"The West German Rector's Conference expects that the comprehensive university (Gesamhochschule):

- will unite the study possibilities to be offered in the tertiary sector of education as fully academic studies obeying, in principle, the same scientific criteria, which is in particular true for teacher education;

- will provide a great diversification of studies not only regarding different subjects, but equally regarding the varying importance being given to scientific thoroughness on the one hand and practical applications as well as professional training on the other hand;

- will allow changing over from one study course to another by vertical as well as horizontal integration of the traditional study courses;

- will increase the flexibility of studies and multiply the possibilities of taking a degree by combining units-credits in a system of successive degrees;

- will create a homogenous and consistent system of academic degrees and abolish the barriers of social prestige, so far being an obstruction to educational advancement and a prejudice to society as a whole.

These objectives must be pursued by a co-ordination of already existing curricula as well as by creating new ones. One condition is the suppression of the hierarchical graduation (evaluation) of existing professional patterns and career regulations; as a matter of fact, the creation of the comprehensive education system will have considerable effect on civil service legislation" (35).

V. Flexibility and diversity in higher education

The West German Rector's Conference's statements on the Gesamhochschule are themselves hypotheses for research. Trow suggests however, that "forces working against genuine diversity in higher education in most European countries are rather stronger than those working to sustain or increase it. This may be debatable, in which case, it is an issue which deserves further comparative study. But if that assumption is true then several questions deserve close attention:

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i. Is increasing control over the forms and functions of higher education by central public agencies or authorities an inevitable concomitant of expansion and increased costs?

ii. Is the (increasing) role of public authorities presently a force working against diversity in higher education, in their functions and standards, their modes of governance, their forms of instruction, their sources of support and their relations to other institutions of society?

iii. If so, are these "standardising" tendencies inherent in central governmental control, or is it possible for central governing and financing agencies to function in ways that sustain and increase the diversity in higher education?

If so, what governing and funding structures would have that effect, and what principles of operation would govern their activities? How can efforts to support diversity be sustained against political pressures in almost all advanced societies?

Trow believes that genuine diversity can only be achieved if systems, as opposed to prescriptive planning is adopted by nations.

VI. A continuing process of change

It is of some importance to evaluate whether or not the systems of higher education have been in a state of continuing change for if they have, then a substantial case exists for Trow's view that a systems rather than a prescriptive approach to planning is necessary if the institutions of higher education are to be marked by both diversity and flexibility. Inspection of the literature suggests that the system of higher education has been in a continuing state of change[x] (36).

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[x] Trow. loc. cit.
"Prescriptive planning, the kind that is most commonly practised by the governing agencies and ministries in advanced societies aims to spell out in detail the size and shape of the system of higher education over the next several decades, and the content and forms of instruction: in brief, what will be taught, to whom, to how many, and in what kind of institution at what expense. Prescriptive planning necessarily rests on an analysis of secular trends (and only some of those). Typically, it bases itself on estimates and projections of the demand for higher education, both in the population at large and by the economy, and the resources available to higher education marked by diversity and flexibility. It would not aim to specify in detail what those institutions of higher education will look like, or how and what they will teach to whom. The difference in these modes of 'planning' is between planning the specific size, shape and content of an educational system, and planning the structure or form of a system of higher education which is best able to respond to the combination of secular trends and unforeseen developments."

Changes in the system in England illustrate this point of view (Figure 1). It is easy to see that growth* stimulates prescriptive planning but such planning does not lead to systems which easily respond to changes in technology, values and events of history. Although most persons in authority admit that the effects of technological and social change can be profound, this lesson does not seem to have been learnt when it comes to planning. There is an "illusion that higher education constitutes a closed system relatively impervious to unforeseen developments" (37).

> "The one restriction being insisted upon in forward planning is simply that, whatever else happens, the district colleges are not to develop into universities" (38).

Although this is backed up by practical statements of policy, ultimately social values and needs may influence significant developments in the universities**. The interaction between the universities and colleges of advanced technology in England was complex. It is evident many changes were taking place in the

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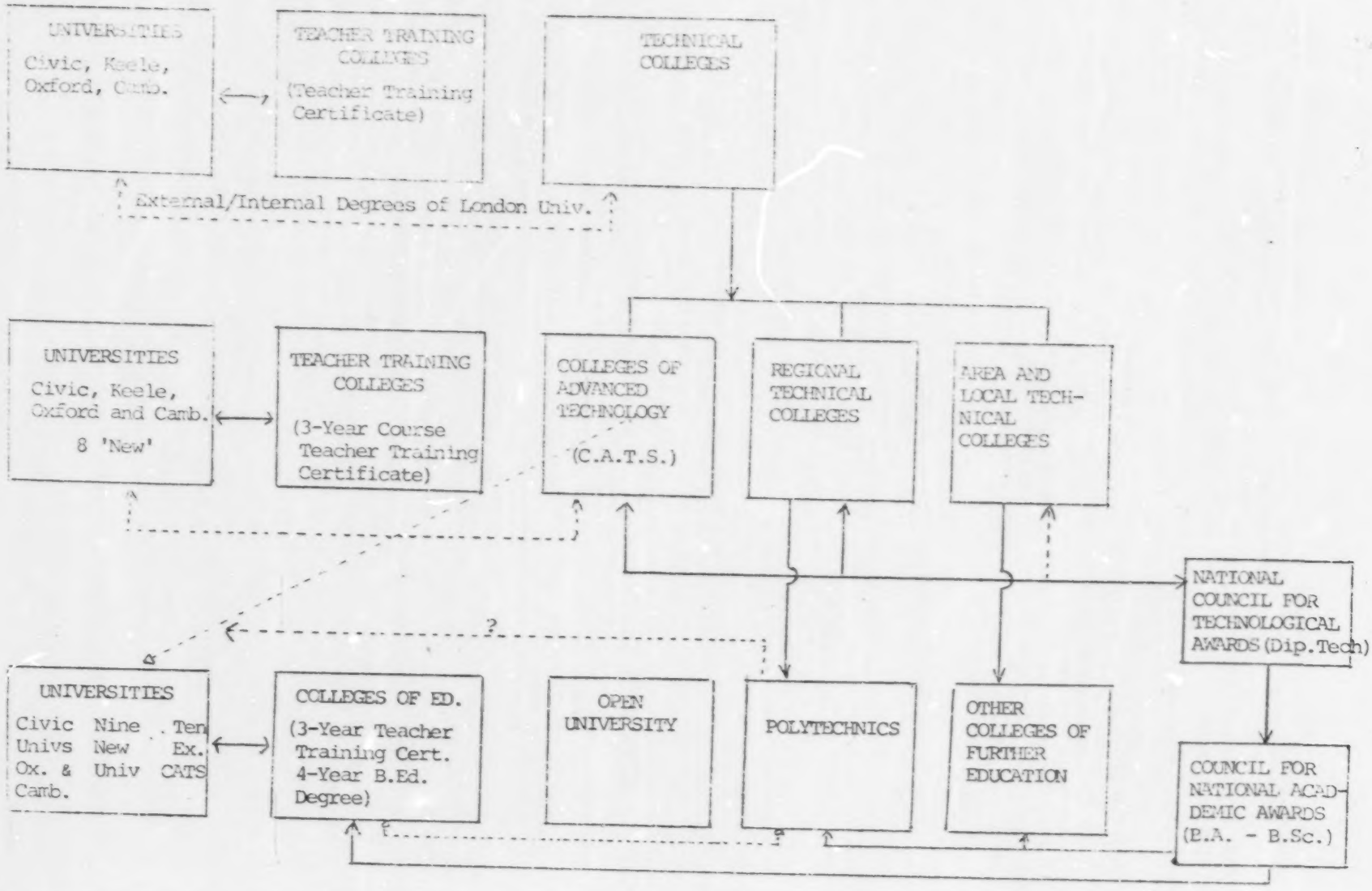
*Trow loc. cit.
"Growth itself stimulates prescriptive planning: the more higher education grows the more money is needed for it, the more interest there is in it among larger parts of the population, the greater demand there is for tight control over its shape and costs. The growing demand for 'accountability' of higher education, for its ability to demonstrate its efficiency in the achievement of mandated and budgeted goals, inevitably translates itself into tighter controls and prescriptive planning. But this control can only be exercised rationally in terms of available knowledge, based on foreseeable trends and projections. The growth of higher education, given a prescriptive control system to maintain and increase its control over numbers and costs, structures and standards."

**Loc. cit.
"It was obvious from the beginning that the district colleges were not to be 'substitute universities'. An important objective for them was in fact precisely to be different, and contribute to breaking down the inflexibility in existing patterns of education at this level"..... "The studies have purposely been planned to differ from those offered by the universities. The students may choose subject-combinations not available in the set, and more specialist-oriented curriculums of the universities." ....."The teachers at the district colleges must have the same qualifications as those for university instructors. In addition, extensive use is made of experts brought in from outside - special teachers and guest lecturers from working life, from research institutions, the universities and institutions of higher learning."

Fig. I

SIMPLIFIED MODEL OF CHANGES IN THE ORGANIZATIONAL STRUCTURE OF HIGHER EDUCATION IN ENGLAND AND WALES



universities in the teaching and curriculum of technological subjects. There was no evidence from either external examiners or industrialists that in spite of some different syllabuses, projects, sandwich structures courses, liberal studies, that the average diplomat (39) was largely different to the average graduate in respect of prospects and performance in industry. Undoubtedly, this was in part due to the expansion of full-time education through the medium of sandwich courses which allowed persons of equal ability into the system. But equally, there were insufficient ideas with which to build new curricula. Reinforcing the traditional was the fact many teachers had been trained in the universities.

Perhaps sufficient restraints exist in the Norweigian system. They did not in the first British attempt at a binary system: there is no evidence that the present system (the second attempt) will be maintained with the same structure and roles. The point is that system studies should monitor binary developments to see (i) if they are but stages in an evolutionary development toward substantially new organisational structures, and (ii) whether it is possible to have different but highly valued curricula. This theme is developed in the next session, with special reference to system planning.

VII. Toward Systems Planning in Tertiary Education

Martin Trow called for a systems as opposed to prescriptive planning approach to higher education. His argument rests on the premise that prescriptive planning used by governments operates against diversity and flexibility, since "it constitutes a closed system relatively impervious to unforeseen developments". An open-system (40)that is truly in exchange with its environment will respond to change (needs). If systems planning has as its aim "the evolution of a system of higher education marked by diversity and flexibility" then the major issues which become sublimated in the general search for status in a prescriptive system will be screened (41) and more satisfactory judgements made as to whether or not they can be diverse and flexible.

Systems studies of institutions considered as open-systems are essential if the processes of change at work in tertiary education are to be understood. They cannot be undertaken without considerable support and co-ordination, as the illustration Fig. 2 of the student on a sandwich course in the environment of a college of Advanced Technology in England around 1962 shows. There is need for (i) a panel of experts to consider the problems, methods and possibilities of comparative systems planning, (ii) on-going semi-action studies,

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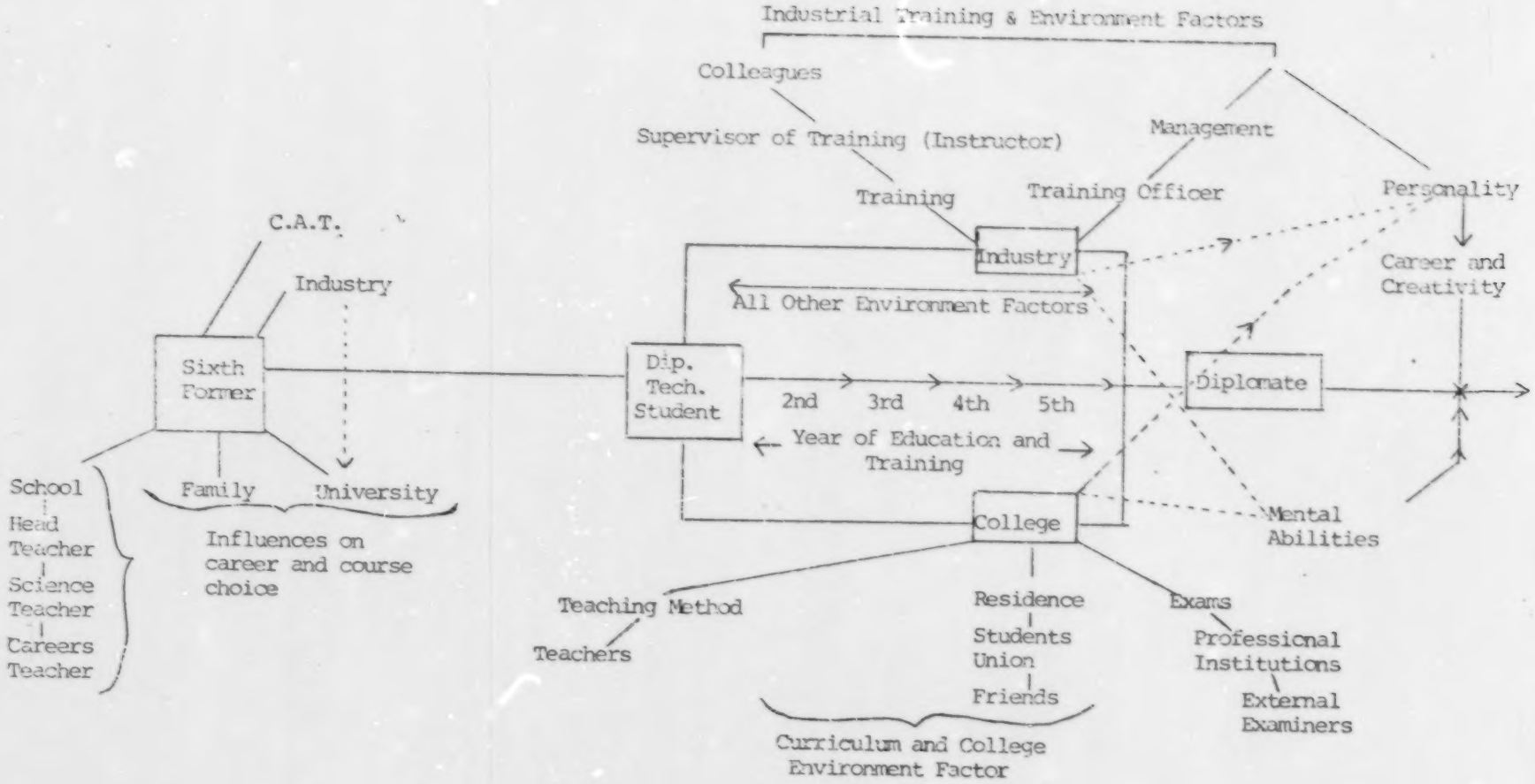
Fig. 2

SIMPLIFIED DIAGRAM OF MANIFEST AND LATENT FORCES ON A DIP. TECH. STUDENT AS HE MOVES THROUGH THE 6TH FORM AND DIP. TECH. COURSE TO FINALS ON A SANDWICH COURSE IN A COLLEGE OF ADVANCED TECHNOLOGY
Circa 1961



and, (iii) historical studies of systems and sub-systems in aid of the development of a theory of change*.

The Gesamhochschule and Swedish systems are examples of bold experiment which need to be monitored. Trow's thesis that centralisation leads to rigidity might be tested if a government were found willing to encourage experiment within the national system. An English university might be persuaded to provide the umbrella for administration and certification for all the tertiary organisations in its sector, ie develop a comparative Gesamhochschule.

VIII. Flows into, within and out of the System of Higher Education.

It is important to monitor the flows into, within and out of the system if the degree of flexibility in the system is to be established. This does not merely imply evaluation by "numbers" but measurement of the abilities, aptitudes, motivations and interests of students in the different sectors of the kind undertaken by Entwistle et al (43). There is also need to attempt longitudinal (44) studies of the products of higher education. This is especially important in respect either of identical courses in different institutions, or equivalent but different courses in different types of institution, and courses of different levels between different institutions (eg as between the Regional Colleges and Universities in Norway).

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* "Higher education can well afford a general moratorium on the prevalent research questions - What is the future of X? and How can X be improved? in favour of a deliberate emphasis on the questions - What is the relationship of X to Y? and Is there confirmation of the thesis?" (42)

The better understanding of explanations should lead to better recommendations.

"Very little work builds upon (not to be confused with summaries) previously reported material; discussions older than 3 years or 4 years are unused as material which never appeared" ..... "Currency must give way to theoretical utility. If the examination of 5 or 10-year old data produces a verifiable insight, and the examination of 4-month old data yields a recommendation from an articulate commentator, then publish the former if there is not room for both."

HOBBS W C, FRANCIS, J B, On the Scholarly Activity of Higher Educationists. Journal of Higher Education, Vol. 44, No. 1, 1973. pp 51-60.

Comparative studies to obtain an understanding of the way in which social systems respond to different qualifications and how the demand for professional status influences the structure of higher education would be of particular interest at the present time for it is of paramount importance, in assessing the relative merits and qualities of qualifications to understand their role in society.

But there is a continuing need to study drop-out rates and causes (45). Drop-out rates have been high in science and technology. As a result, it has been argued that there ought to be closer links between colleges in the vocational sector and the university. The idea in Holland that students should be able to move out of the university into the technical college is of considerable importance. Equally, it is important to know the transfer rate from the university institutes of technology in France into the universities. Most discussion emphasises the value of upward mobility within the system but takes little note of the possible effects of a flexible system on the recoupment of drop-outs. An important unpublished study by Howard (46) of the drop-outs from one of the colleges of advanced technology showed that when industry sponsored students on degree sandwich courses, it was ready to place them on day release courses which would lead to a professional qualification if they "failed".

But this was only true of engineering students. College sponsored science and maths students did not recoup with ease. Historical studies might in this instance give a more sophisticated judgement on the statement sometimes made by industrialists that the British system was more flexible in 1960 than it is now. The figures noted by Perkins are persuasive but they have nothing to say about cost-effectiveness (47). It would seem that if provision can be made for alternative modes of education which lead to professional qualification and, provided that sponsorship can be maintained, individuals can recoup. But this is another example which supports Trow's thesis that institutions tend to model themselves on the most prestigious values. In this example the prevailing value assumptions were that full-time education was preferable to part-time. No objective studies were made of the qualities of the products of the different schemes in their work environment. One particular study of a firm in Britain showed that the possession of a lower order qualification would not have been a bar to promotion to the highest jobs (48). Of course this is only for one firm and there is need to repeat similar studies in other firms. Nevertheless, there is reason to believe that a repetition of the study would yield similar results in many firms in the engineering industry. This particular study once again illustrates the value of objective studies of the past. Taken together it seems that change of routes in the direction university to technical college requires reinforcement of the value of the technical college by the institutions concerned with the aid of professional certification. Although the study of the firm highlights the need for recurrent education (training), it did not envisage traditional approaches to such training (49).

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IX. Assessment.

Qualifications are a major determinant of the extent to which a system can be made flexible. The degree of interchangeability as between a qualification and other curricula is a key index. They raise the question of whether curricula can be common (ie apart from the issue of the desirability or otherwise of common curricula). They are part of the social value system and deeply embedded. The comparability of professional qualifications is a major issue within the European Economic Community (50). There are many variants. For example, at Roskilde we read "Concerning evaluation, we shall, to a large extent, only use the notes 'passed' and 'failed'" (51). The new universities in England "have abandoned streaming into honours and pass students - first and second class citizens, and admit all students to a common degree scheme, either labelled honours throughout, or called honours after the preliminary or Part I stage of the degree" (52). In Scotland the tradition is different and more comparable with, say, Ireland. The honours course is of 4 years' duration, the pass course 3 years. The New University of Stirling adopted this system, but a common Part I divides them into General and Honours students. Apart from Stirling, degrees are classified into First, Two-one, Two-two, Third and Pass honours categories.

These changes were in part a response to the view that the general pass degree was inferior to specialised honours degrees. But although these changes have been made we do not know which arrangement is best suited to the learning needs of students. As a consequence, we do not know if one system is more flexible than the other. Is it better, for example, for a pass level student to pursue the whole range of studies necessary for an honours qualification and obtain a pass level, or, pursue a limited range of studies and have the chance of doing well in these studies with the possibility of completing a fourth year for honours? At the very least, studies of student attitudes to this problem ought to be made. If they can be related to other student characteristics such as personality, interest and aptitude, so much the better.

Some authorities have suggested that the American credit system might aid flexibility and diversity. However, Barbara Burn's paper for the OECD (53) does not hold high hopes for this unless national "systems are founded on or moving towards values similar to those which the American credit system tries to implement. And if the foreign higher education system is already committed to these values, wide access, interfaculty and interinstitutional transfer, curricular choice, the integration of recurrent education with the degree system, student-oriented higher education, applying external experience toward a degree etc, then the credit system may be superfluous". Moreover, Burn indicated that the shortening of first degree programmes favoured by the Carnegie Corporation (54) and the emergence of non-traditional studies may

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be hastening substantial changes in the credit system which, on rational grounds, "would appear to be fast becoming irrelevant".

Burn makes the point that a "credit system implies that time serving is the basic requirement for a degree, and fails to take account of the fact that what students learn may have little correlation with class attendance; learning may even be enhanced when classroom attendance requirements are reduced" (55).

It is the "time serving" or "chair sitting" approach to the comparability of qualifications which makes a nonsense of the European community's proposals on professional qualifications. There is a danger that this will be coupled to statements of syllabus. This stand is quite remarkable in the light of the progress made in curriculum development in the past 10 years.

Clearly, the equivalence of qualifications depends on the skills which the person has on leaving his professional course. These will be a funcion of the learning experiences to which he has been exposed. There may or may not be adequate procedures for evaluation. Be that as it may, the systems approach developed by Meweuse (56) might have quite different behavioural outcomes to procedures based on project and discovery methods. Moreover, even assuming that the same skills were developed, the time required for their development might be substantially different as between the two methods. Nowhere is this more pertinent to the present debate than on the issue of the British approach to engineering which couples a 3-year course in engineering science (or 4-year sandwich) followed by 2-years of training in industry and subsequent practical experience. This is not regarded by many Europeans as a satisfactory equivalent to the longer education received in the Technische Hochschulen.

If there are differences between the 2 types of course, it is of more than passing interest to know in what way the products differ for among other things the cost-effectiveness of the 2 approaches will be substantially different. Such differentials can only be derived from statements of objectives, descriptions of learning experiences and their evaluation (57). Sophisticated techniques have been developed in the past 10 years by Meweuse and his colleagues for such evaluation (58) but in completing such studies it is important to remember that the skills developed by a university course may not necessarily be the same as those used in industry. Thus, any attempt to determine the comparability of professional qualifications must be related to comparative studies of the work actually done by professionals. Mewuse's techniques, taken together with those developed by Youngman (59) have shown that substantive studies of this kind are possible. Differences between the two techniques are outlined in Appendix A. While such studies should be sponsored on a comparative basis, there are other important tasks appropriate to the evaluation of qualifications

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and assessment structures.

First, there is a need to generate discussion on the relative merits of different assessment procedures. Detailed reports of structures need to be assembled before study groups could meet with profit. The writer has in mind an up-to-date version of the Committee of Vice-Chancellors' 1969 Report on Assessment (60), but on a comparative European basis.

Second, there is need for comparative descriptions of the aims and organisational structures of different professions and disciplines. These are likely to be best achieved through member nation study groups and might take the form of screening exercises (61), or, reports aimed to answer the questions implicit in the frame of reference outlined in Appendix C.

Third, there is need to generate similar discussions among member nation study groups to determine the behavioural objectives of their disciplines independently of the sophisticated studies. Part of a statement of objectives for engineering science is given in Appendix B.

X. Specific as opposed to general data

The study of comparative education can only be advanced if there is a willingness on the part of all to involve themselves with specific data. While descriptions of university curricula such as those in the insets (1 and 2) provide a valuable insight into the goals of institutions, they say little about procedures or the effectiveness of such procedures. Many more details are required. In this respect there need to be many more documents of the kind published by the Council of Europe on Curriculum Development and Reform in Norway (62). Without this data there will continue to be much argument and little understanding. It would be useful if, in the preparation of objectives, syllabus and timetable, statements could be obtained from member countries for comparable subjects and levels. Flow diagrams of the type published by EUSEC (63) would be an invaluable aid to comparative study. But the development of such materials should not subvent the search for and subsequent declaration of objectives for without these it is neither possible to devise learning experiences or develop methods of assessment, as the model of curriculum development illustrates (Fig. 3).

XI. Specific data about innovation

It would be of value if some of the problems faced by institutions in the development of new innovations could be described either by individuals within institutions or by external observers imported for this purpose (64). A frame of reference which results in relatively short, but valuable reports developed by a working party of the Society for Research Into Higher Education is given in Appendix C (65).

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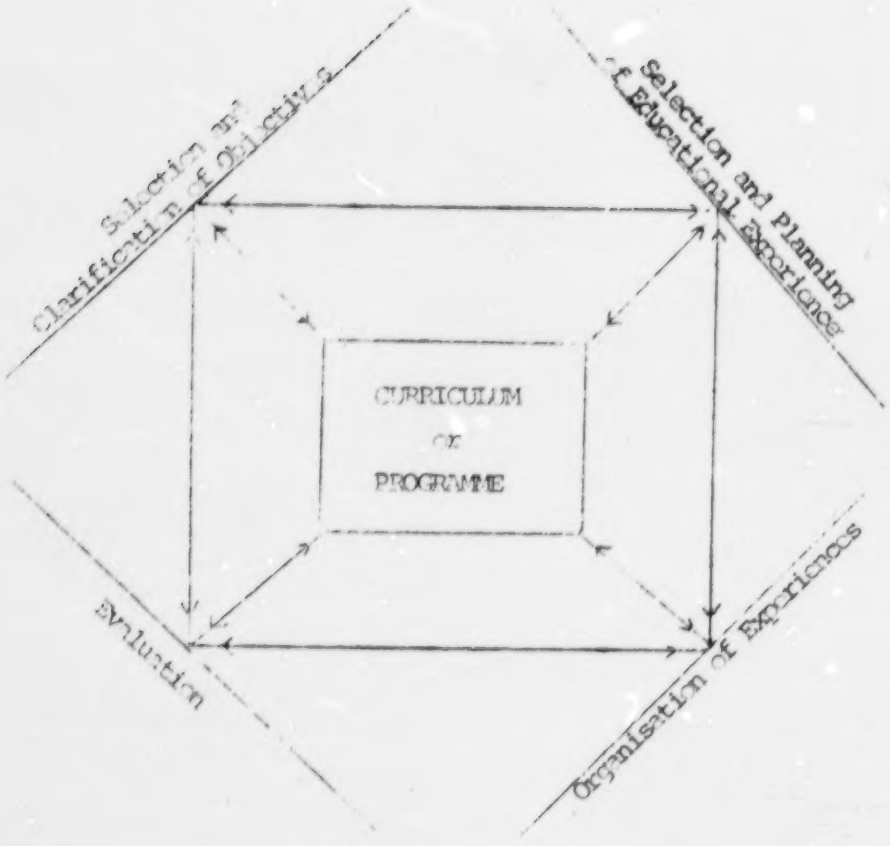
Fig. 3


Selection and planning of Educational experience
CURRICULUM
OR
PROGRAMME
Organisation of Experiences
Evaluation

INSET I

Description of the Sussex School of Studies from PERKIN, H. Innovation in Higher Education. New Universities in the United Kingdom. Paris, 1969. OECD.

Sussex invented the School of Studies, in which the undergraduate could learn the essentials of every subject which was relevant to his area of interest, and learn them in common with others, with somewhat different interests within the same general field, before going on to specialise in some narrower part of it. The early schools were centred on the notion of studying either a particular area of the modern world in all its aspects - Europe, Britain and America, Africa and Asia - or around a cognate group of subjects within a general field of study - social studies, physical sciences, biological sciences. Since then have been added Schools of Educational Studies, Molecular Sciences, and Applied Sciences. Within each school all the undergraduates take a common preliminary course, of two terms, before going on to specialise more, but not very narrowly, in the final degree course of 7 terms. In the preliminary course some of the subjects are common to all the schools on each side of the arts-science divide. All the students in the arts schools take history ("An introduction to history") and philosophy ("Language and values") together with a third course determined by the choice of school, such as, "critical reading" in either English or European literature in the schools of English and American studies and European studies (plus a language course if required), or "The economic and social framework" in the schools of social studies and African and Asian studies. All the students in the science schools take basic mathematics and a course in "Structure of matter" together with one and sometimes two other subjects chosen from chemistry, biology and two other kinds of mathematics.

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INSET 2

Two extracts from Description of Roskilde University by Dr. Erling Olsen in CRE-Information, October 1972.

(1)
"The institutional set-up is very much like that of the German Gesamhochschule. Roskilde University Centre is the one and only institution educating the future primary school teacher as well as the future secondary school teacher and the future university professor. Instead of the traditional specialised education of 6-7 years' duration, Roskilde University Centre starts by offering every student a general education of 2 years' duration, a so-called basic education. We offer 3 such basic education courses, one in philology, one in social sciences and one in the natural sciences. A basic education has no vocational aspect at all. Its only purpose is to be the common entry to a wide range of specialised education offered by the university centre."

(2)
"The idea behind our teaching and learning method is to reduce lectures to a minimum, to let the students work in small groups, to provide them with all sorts of audio-visual facilities and teaching machines, and to use the teachers as consultants to the groups. This should save economic resources, improve the quality of the teaching and learning process, enable us to get rid of some of the worst aspects of competition and make the students accustomed to team work."

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XII. Curriculum development and evaluation in higher education

The importance of evaluating and monitoring change cannot be overstressed. Effective evaluation depends on the willingness of institutions to have themselves evaluated either internally or externally. Ultimately every person in higher education should be encouraged to be his own evaluator. In this respect, the Open University has an important role to plan since the development of new approaches to curriculum depends in no small way on the provision of adequate learning experiences. With the resources available and the unique approach to study that it offers, it is in an ideal position to evaluate the effectiveness of a wide range of learning experiences. It seems to have made a good start (66). Like all innovatory institutions it has become rather overburdened with visitors. It would seem sensible for it to publish research reviews from time to time through the international agencies.

At its broadest evaluation implies a study of the system. At its most limited, it implies a study of a particular component in the learning process. But evaluation of curriculum is a particularly difficult area of research. It does not lend itself readily to traditional methods of research. K G Collier, with whom the writer discussed this project said:

"Secondly, evaluations should be conducted on an 'anthropological' rather than an 'agricultural botany' model. Because experiments are usually carried out by small bands of enthusiasts on a small scale, they rarely provide the conditions for the exercise of the strictly 'scientific' type of investigation. The usual model for such evaluations is what Parlett and Hamilton (67) refer to as the 'agricultural botany' type: the effectiveness of an innovation is assessed "by examining whether or not it has reached required standards on pre-specified criteria. Students ... are given pre-tests ... and then submitted to different experiences ... subsequently, after a period of time, their attainment ... is measured to indicate the relative efficiency of the methods ... used. Studies of this kind are designed to yield data of one particular type ie 'objective' numerical data that permit statistical analyses. Isolated variables like IQ, social class, test scores, personality profiles and attitude ratings are codified and processed to indicate the efficiency of new curricula, media or methods."

"But, as Parlett and Hamilton note, there are serious defects in this approach. In the first place, because of the small scale it is extremely difficult to set up genuinely matched 'experimental' and 'control' groups: this would presuppose a scale of organisation and administrative manipulation to which most experimenters would probably not

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aspire and few would have access. The very process of attempting to create such controlled conditions could well render the experiment so artificially neat and contrived as to remove it from reality."

"A second defect arises from the fact that experimental schemes rarely remain static during their period of operation. Unforeseen circumstances arise, whether of organisation or of personal responses and relationships, which demand of the teacher - if he is to respect his professional responsibilities to his pupils - that he should adapt the scheme. Education is fundamentally concerned with relationships and responses, between teachers, pupils and the material of study, and experimental schemes ought to take second place to the needs of the people concerned."

"In addition, a strict attention to quantified data can lead to the exclusion of other evidence - 'casual' or 'subjective' or 'anecdotal' - which may in fact be more significant for the understanding of the way the experiment has worked out in its total institutional context. Thus, inadequate attention may be given to the specific features of the personal and political relationships in the institution concerned, for a full understanding to be gained."

"An alternative approach to evaluation has been outlined by these 2 authors, which they term 'anthropological'. There are 3 stages. In the first the investigator visits the institution(s) concerned, meets the people involved, observes what is going on, attends meetings and records discussions, builds up a continuous record of events, and thus forms a broad view of the exercise as a whole in the institution(s). In the second stage, he selects a number of features for 'sustained and intensive' enquiry. He records interviews with staff and student participants, both structured and open-ended, the staff seen including not only the teachers concerned but the administrators and others who are indirectly involved. He may arrange for diaries to be kept by a number of individuals and obtain autobiographical and eye-witness accounts of events. Where it is useful he will obtain information from questionnaires, attitude tests and so on, nonetheless rigorously designed and interpreted because of the 'anthropological' context. In the third stage, the investigator seeks the general explanatory principles underlying the whole experimental scheme, assessing the aims, implicit and explicit, and tracing the sequences of cause and effect. The authors emphasise the need to take precautions against partiality in the investigators by cross-checking the findings and making explicit in a clear and detailed way the criteria by which particular sections of evidence are judged important or unimportant. The investigators must be personally acceptable in the institution, scrupulous in respecting the views and the confidentiality of the people, whether staff or students, engaged in the experimental scheme, and entirely open and candid in elucidating their own role."

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The present writer holds, as previously stated, that every teacher should encourage in himself and his colleagues the habit of evaluation (68) and secondly, that despite the defects of traditional approach it can have much to offer (69).

XIII. The Open-System of Higher Education

The open-systems approach to the study of higher education requires studies of both schools and occupation. The requirements of higher education influence the school curriculum. The Dupare Committee, reporting on the situation in the Netherlands had doubts as to whether pre-university education was cast in the right mould. It suggested a 3-year academic preparatory school (VAO) which could be achieved by combining the last 2 years of gymnasium and atheneum (classical and modern pre-university schools) and the first year of the universities (70). In Germany a Convention on Admission to Higher Education was introduced in 1972 after the Constitutional Court of the Federal Republic gave its verdict on the numerus clausus problem and ruled that everyone who possessed the necessary qualification (the Abitur or its equivalent) had the right to higher education. Restriction of admission was constitutionally acceptable when certain conditions in respect of the availability of places were unfilled. One of the decrees states:

"Of the remaining places (ie 85% of total) 60% will be distributed according to aptitude and achievement, and 40% according to the applicant's place on the waiting list, ie the number of years he or she had been waiting for admittance."

Since selection will be based on the abitur and this is not a national examination, it will be necessary to calculate a national average (71); such regulations must introduce a competitive element into the school system.

A 2-way process is very much in evidence in England for, with the raising of the school leaving age to 16, the Schools Council has set up working parties to consider the possibility of introducing a new examination for university entrance which will be broader in scope than the present scheme. This might influence the structure of first year courses. But already the pressures of student choice and the relative shortage of jobs for graduates (72) have made themselves felt particularly in the science and technology faculties where there has been a trend toward joint-honours degrees (eg physics with economics in the final year, or 3-year courses in engineering science and management). However, there remains a steady demand for traditional courses in these faculties.

Students find it difficult to change courses once they are at university. The broader first year courses at the new universities allow some change. The striking illustration is Keele. It has the most revolutionary degree structure of all the British universities.

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"The 'foundation' (first year) course was to be taken by all students and designed as a whole to give an understanding of the heritage of Western civilisation, of modern society and of the methods and influence of the experimental sciences (73)."

This course was the subject of a substantial investigation by A H Iliffe (74). He showed that it enables a student to have an account of the real nature of the subjects offered and allows him to study at greater depth some subjects which he has not studied at 'A' level. Normally in the English system there is little room for change of subject once the student has made his choice. The Keele system allowed change and 70% of the students changed their minds during the foundation year. Moreover, those without an 'A' level pass in the subject eventually studied during the remaining 3 years have remained at the same level.

The questions raised by this study relate to the problem of recurrent education. Do 'A' level passes necessarily indicate the route a student should follow in his university year? Would an enforced cooling-off period between school and university benefit the student - would the drop-out rate then be less? Wastage rates tend to be higher in science and engineering subjects (75). As a consequence, the value of a cooling-off period has been much discussed (76). While there is much support for the idea few have any faith in it without legislation coupled with the willingness of industry and commerce to provide effective experiences and governments to accept this as the normal route to higher education. But if recurrent education is to be effective there needs to be a much greater understanding of the learning process on the part of learners and a change in the attitudes to current views about the most appropriate structures for higher education. A re-examination of the value of such a period as a means of providing students with the means of realistic evaluation of short cycle diplomas, or standard degree courses would seem worthwhile.

If numerus clausus is to operate, it is worthwhile initiating research on a comparative basis to determine the effects of waiting before entering the system. Recent work in England (77) and Holland (78) on the training of people in industry suggests that around middle age, managers need some form of retraining. Such evidence that there is suggests that persons in this age group find retraining difficult (79). It is not part of their schemata. The positive aspect of recurrent education is that it should enable people to adapt more readily than in the past to changes in their careers. But, as other industrial training research suggests, the person who has learnt how to learn is likely to be more adaptive than one who hasn't. Similarly, people who participate in regular learning experiences find learning easy compared with those who don't. The problems of training adults have been much investigated and recurrent education has much to learn from the results (80), as well as from the experience of the Open University. But there is need to place these results in the wider context of such problems as:

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- school preparation for learning;
- the length of training for a particular skill on leaving school;
- ideal frequency of recurrent education;
- the nature of recurrent education;
- the role of industry in recurrent education.

Many of the delegates to the 1973 OECD Conference on Future Structures of Post-Secondary Education considered that the relation between education and work presented the most pressing problem. When recurrent education is taken as the focus of the system, answers to the above questions may lead to substantial changes in the structure of higher education, the type of courses offered and the strategies of learning undertaken. Of all the aspects of higher education considered, the problem of recurrent education would seem to be the issue most in need of theory, research, development and discussion.

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APPENDICES AND NOTES

APPENDIX A

A framework for the study of professional examinations. (Used by a working party of the Society for Research into Higher Education, London.)

A. Description of the organisational structure of the profession.

B. Discussion of the effects of the edicts of the various professional, political and legal bodies on the educational structure of the profession.

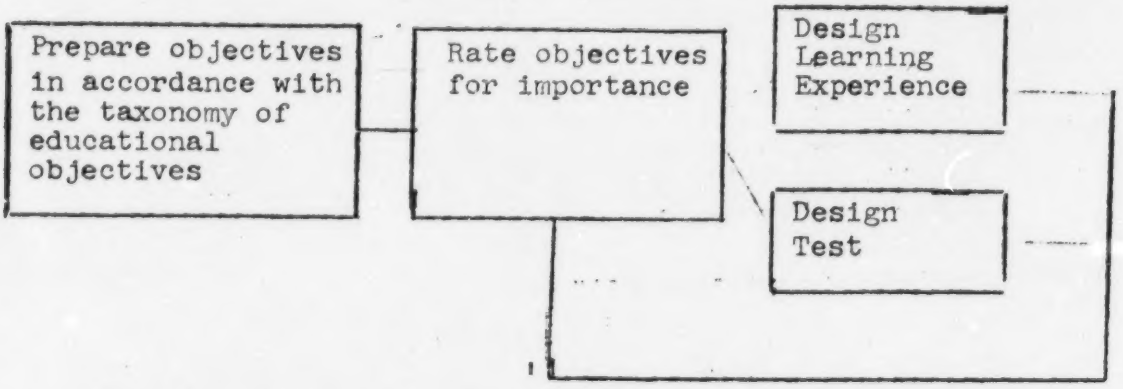
C. The objectives of first degree courses, and the techniques used to test their attainment.

D. Changes and their effects in the overall educational and examination structure.

E. Problems of measurement, and possible new techniques.*

Fig. 6

TWO APPROACHES TO THE DEVELOPMENT OF INSTRUCTIONAL SYSTEMS


Prepare objectives in accordance with the taxonomy of educational objectives
Rate objectives for importance
Design Learning Experience
Design Test

A. Closed system in which the objectives are defined by teachers from models.

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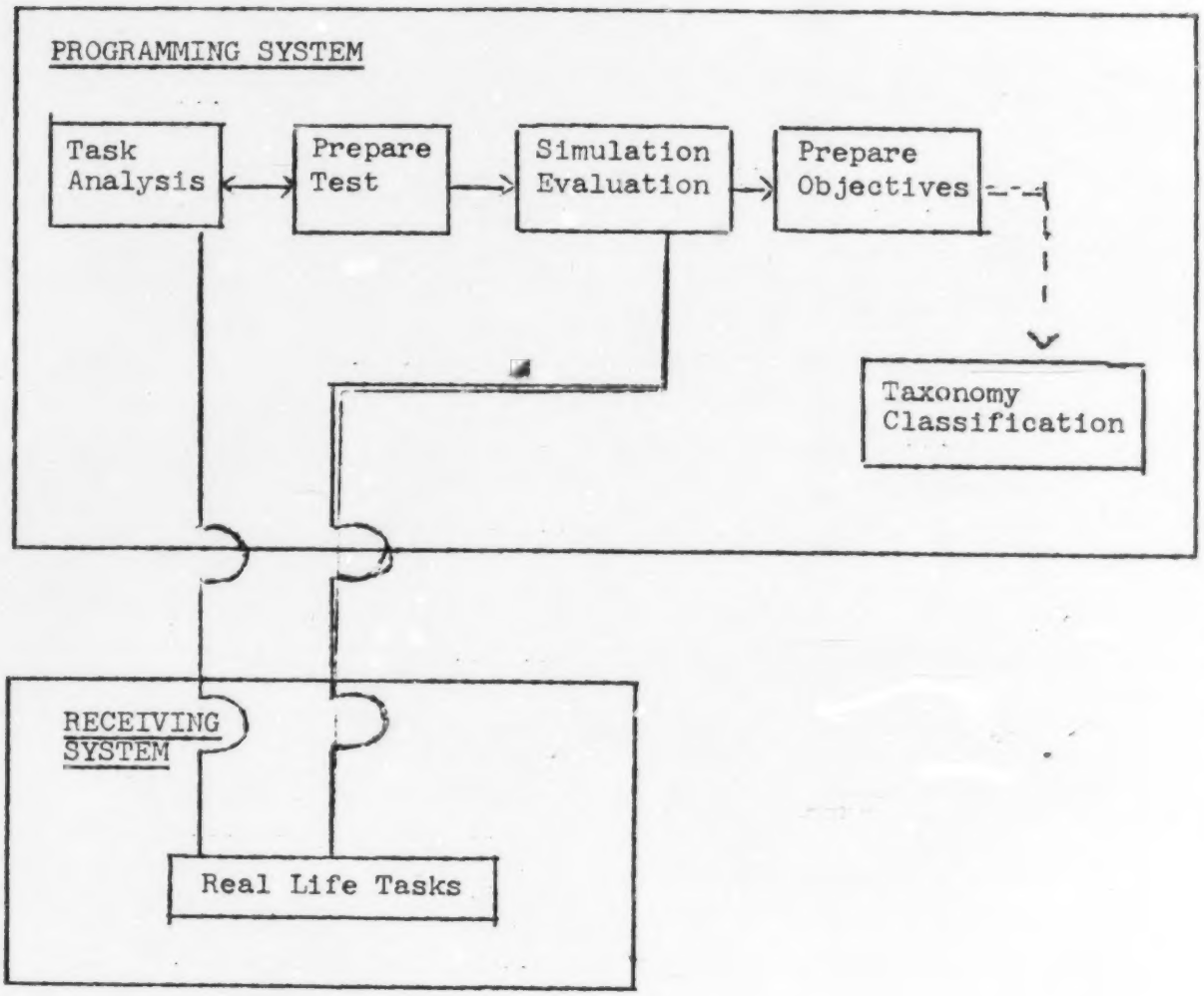

B. An open, coupled programming system.

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APPENDIX B

Extracts from the Statement of Objectives for Engineering Science at 'A' Level (ES/N2. Manchester, 1972, Joint Matriculation Board).

Knowledge, understanding and abilities to be tested are:

Knowledge and understanding of:

Comprehension;
Communication;
Analysis;
Synthesis and design;
Evaluation and judgement.

Each of these is broken down into abilities. For example, the abilities required to evaluate and judge in an engineering situation are considered to be:

1. Comprehension

The ability to:

(a) understand and interpret scientific and other information presented verbally, mathematically, graphically, or by drawing;

(b) appreciate the amount of information required to solve a particular problem or the fact that sufficient information may not exist;

(c) understand how the main facts, generalisations and theories of engineering science can provide explanations of familiar phenomena;

(d) recognise the scope, specification and requirements of a problem;

(e) understand the operation and use of scientific apparatus and equipment;

(f) recognise the analogue of a problem in other related fields of engineering science and practice.

2. Communication

The ability to:

(a) explain principles, phenomena, problems and applications adequately in simple English;

(b) formulate relationships in verbal, mathematical, graphical or diagrammatic terms;

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(c) translate information from one form to another;

(d) present the results of practical work in the form of reports which are complete, readily understandable and objective.

3. Analysis

The ability to:

(a) break down a problem into its separate parts;

(b) recognise unstated assumptions;

(c) acquire, select and apply known information, laws and principles to routine problems and problems that are unfamiliar or presented in a novel manner.

4. Synthesis and design

The ability to:

(a) design the manner in which an optimum solution may be obtained efficiently and to propose alternative solutions taking into account the restraints imposed by material economic and social considerations;

(b) make a formal specification, having decided on the design or scheme;

(c) make a plan for the execution or manufacture of the design or scheme;

(d) use observations to make generalisations or formulate hypotheses;

(e) suggest the new questions and predictions which arise from the hypotheses formulated;

(f) suggest methods of testing these questions and predictions;

(g) find the optimum solution to an engineering design or other problem and give valid reasons for the rejection of alternatives.

5. Evaluation and judgement

The ability to:

(a) check that hypotheses are consistent with given information, to recognise the significance of unstated assumptions and to discriminate between hypotheses;

(b) assess the validity and accuracy of data, observations, statements and conclusions;

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(c) assess the design of apparatus or equipment in terms of the results obtained and the effects upon the environment and suggest means of improvement;

(d) judge the relative importance of all the factors that comprise an engineering situation;

(e) appreciate the significance of social, economic or design considerations in an engineering situation.

Of special interest is the list included in a section on Attitudes, Motives and Interests. It reads:

'The development of the engineering attitude to its highest level is not easy, and a course in Engineering Science cannot expect a high achievement in this respect. Nevertheless, if the list is borne in mind it may directly help the teacher and student as well as indicate a balance between different aspects of the course.

The following attitudes are relevant:

(i) The recognition of the need for a method which is organised, careful, and intellectually honest - particularly in respect of experimental observations.

(ii) The acceptance of the need to consider the parallel social and economic bases of engineering.

(iii) An awareness of the advantages of deriving the more particular relationships from the basic concepts.

(iv) An awareness of the advantage of seeking parallels in other fields to relate one kind of phenomenon to another.

(v) An awareness of the advantage of attempting to reduce a social, economic or scientific situation to a simple system.

(vi) The recognition of the fact that it may be necessary to exercise judgement as well as reason when dealing with a problem.

(vii) The recognition of the fact that a perfect answer to a problem may not exist and that the best available answer must be sought.

(viii) The recognition of the fact that not all the information necessary to tackle a problem may be available, and that some which is available may not be relevant.

(ix) The acceptance of the fact that more than one way of thinking exists and that different ways may be more appropriate to different problems or different stages of the same problem.

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(x) The recognition of the fact that the required exactness of calculation may vary from case to case (for example, from a preliminary, quick, "order of magnitude" estimate to a precise forecast of performance).

Unlike the examination objectives related to the knowledge and the abilities to be tested, not all of these attitudes can be directly measured. They can, however, be detected in the way students tackle problems based both on syllabus content and on coursework.

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APPENDIX C

FRAMEWORK OF ANALYSIS FOR INNOVATIONS IN HIGHER EDUCATION

A. Context of innovatory scheme

1. Institution: What is the institution in which the innovation has taken place? - a technical college? - a university department?

2. Structure of institution: What is the structure of the institution, in terms of decision-making and consultation? - in terms of scale of sections of institution? How do members perceive the distribution of power? Is it useful to distinguish between coercive power, power based on rational calculation, and power based on mutual regard and trust (Etzioni, Bennis)?

3. Climate of opinion in institution: What were the prevailing ideology and values in the institution bearing on this innovation? Was there any general interest in innovation or in the problems with which this innovation was concerned?

4. Factors external to institution: What factors outside the institution affected the development of the innovation, for example, in the shape of general movements of opinion or decisions at government level?

B. Objectives of scheme

1. Problem tackled; scope of scheme: What problem or opportunity was the designer of the innovation concerned with eg an absence of objective data regarding the effectiveness of a course; deficiencies in a particular aspect of an institution; need for new opportunities of a certain kind?

2. Specific aims, behavioural objectives: What were the precise purposes of the innovation eg improving students' knowledge or teachers' skills; developing fresh attitudes in students; creation of a new course; facilitating experimentation? Was there any differentiation of objectives among the various supporters of the scheme? Was there any progressive articulation of objectives during the development of the scheme?

3. Underlying values or criteria by which the scheme was judged to be an improvement: What were the values or assumptions in virtue of which the supporters of the scheme judged it to be worth supporting eg a belief in the need

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for research on the procedures of higher education; a belief in the fuller collaboration between those in authority and those under it; a belief in the need for closer integration between academic study and first-hand experience? Note difficulty of making such assumptions explicit without banality.

C. Means of bringing about the innovation concerned

1. Source of decision to proceed: Who made the decision to proceed? a committee? the head of an institution? an individual lecturer? How much consultation was there? Were students involved?

2. Methods used in innovatory scheme: What methods were used for carrying out the innovation? organisation of conferences? setting up of working party? individual carrying out experiment? series of committee studies and decisions? setting up a new body in institutions?

3. Personnel involved: What people were involved in carrying out the innovation? a team? a committee? an individual backed by a committee? students? Who acted as "change-agent"? a member of the institution or somebody appointed from outside? Was there a research officer connected with the scheme? What were the attitudes of the various persons to the scheme?

4. Financial aspects: What finance was required and what was its source?

5. Modification of methods during course of innovation: How far were the methods modified in the light of experience as the scheme was put into operation?

D. Evaluation of scheme

1. Concluding appraisal: How far did the scheme succeed in achieving its objectives? What evidence is available, whether subjective impressions or objective data?

2. Judgement of degree of success or failure: How far has the innovation been incorporated in the regular practice or structure of the institution? If it has not been so incorporated, how far has it provided results or lessons useful in subsequent experiments or innovations? How far have these been formulated and published? What were the causes of rejection?

3. Diffusion of innovation: Has any evidence come forward on the separate problem of the diffusion of the innovation to other institutions?